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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,762	11/26/2003	William J. Swanson	S697.12-0023	9705

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EXAMINER	
DANIELS, MATTHEW J	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/723,762	SWANSON ET AL.	
	Examiner	Art Unit	
	Matthew J. Daniels	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 November 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-19 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 11/01/04, 11/26/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, or by the Applicant's information disclosure statements, they have not been considered.

Specification

2. The specification is objected to because of the following informalities: in this case, the claim to benefit of a previously filed application under 35 U.S.C. 120, 121 or 365(c) should include the expression "now Patent No. _____" after the filing date of the parent application because the parent application was issued as USPN 6722872.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1, 2, 5, 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433). **As to Claim 1**, Crump teaches a method for three-dimensional modeling

comprising heating a build chamber to an elevated temperature (15:20-52), dispensing modeling material from an outlet of a dispensing head onto a base provided in a build chamber (Fig. 1) and moving the dispensing head and the base in three-dimensions with respect to one another in synchrony with the dispersing of modeling material so as to build up a three-dimensional object of predetermined shape on the base (16:17-68). Crump appears to be silent to maintaining physical and thermal separation between the heated build chamber and the gantry that controls motion of the dispensing head. However, these aspects would have been prima facie obvious because Crump teaches carriage rods for providing translational movement by a servo motor (12:45-63) and that the dispensing head remains inside a controlled environment (15:21-27). It would have been prima facie obvious to also isolate the gantry (Items 288 in Fig. 13 and Items 245, 288, and 290 in Fig. 17) from the heated build chamber in order to avoid transferring heat from the chamber to the dispensing head in the controlled environment chamber (Fig. 13, Item 202). **As to Claim 2**, controlling motion of the base would have been obvious over Crump's teachings (16:17-38). **As to Claim 5**, Crump teaches that moving either of the dispensing head or base in any of the axes is possible (16:17-38). **As to Claim 6**, providing a feedstock material to an inlet external to the build chamber would have been prima facie obvious because Crump teaches a coil (Fig. 5) and the supply rod being inserted into the supply chamber (7:19-25).

4. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433) in view of Scholz (USPN 5120476). Crump teaches the subject matter of Claim 1. See the rejection of Claim 1 above under 35 USC 103(a). **As to Claim 3**, Scholz teaches that it is known to have a hanging base which would have maintained both physical and thermal

separation between the heated build chamber of Crump and the lift which controls it (See arrow in top right of Scholz's figure). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Scholz into that of Crump because doing so would have avoided a complicated feedthrough into the base of the chamber of Crump.

5. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433) in view of Gore (USPN 5257657). Crump teaches the subject matter of Claim 1. See the rejection of Claim 1 under 35 USC 103(a). **As to Claim 4**, Gore teaches that either the layered material or the lower bead can be heated and controlled within well-defined temperature ranges to avoid weak bond formation (5:10-24). Gore additionally teaches that the equilibrium temperature is preferably only slightly below the solidification temperature of the liquid-phase material for objects that are built up rapidly (6:42-45). Because Gore additionally teaches depositing tin (6:65), which melts at approximately 232 degrees C, it would have been obvious to one practicing the combined method that in order to deposit tin, a build chamber temperature greater than 200 degrees C would be needed in order to provide an equilibrium temperature only slightly below the solidification temperature in order to maximize the build speed (6:42-45). Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Gore into that of Crump in order to minimize voids and avoid weak joint or bond formation and stress between layers.

6. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433) in view of Reiss (USPN 5581994) and Beeston (USPN 3472452). Crump teaches the subject matter of Claim 1. See the rejection of Claim 1 under 35 USC 103(a). **As to Claim 7,** Beeston teaches a chamber heated by convection such that an air flow pattern is created in the chamber (Fig. 1, arrows 72 and 70). Reiss teaches a method for cooling a thermally loaded component by deflecting an air flow pattern towards the thermally loaded component (1:5-17). Crump teaches that control of the temperature around the dispensing head and guide tube is achieved by providing conditioned air to the area by means of a conduit (13:50-54). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Reiss and Beeston into that of Crump in order to a) provide temperature control of the area around the dispensing head by providing a conduit (Crump 13:50-54), b) provide a constant temperature inside an enclosure while the outside temperature varies at random (Beeston 1:26-30), and c) cool the thermally loaded component by deflecting an air flow pattern towards the thermally loaded component (Reiss 1:5-17).

7. **Claims 8, 11, 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433). **As to Claim 8**, Crump teaches a method for three-dimensional modeling comprising heating a build chamber to an elevated temperature (15:20-52), dispensing modeling material from an outlet of a dispensing head onto a base provided in a build chamber (Fig. 1) and moving the dispensing head and the base in three-dimensions with respect to one another in synchrony with the dispersing of modeling material so as to build up a three-dimensional object of predetermined shape on the base (16:17-68). Crump teaches motion control components

(Items 36 and 38 in Fig. 11), which would have obviously been thermally and externally located to the build chamber. **As to Claim 11**, Crump teaches that moving either of the dispensing head or base in any of the axes is possible (16:17-38). **As to Claim 12**, providing a feedstock material to an inlet external to the build chamber would have been prima facie obvious because Crump teaches a coil (Fig. 5) and the supply rod being inserted into the supply chamber (7:19-25).

8. **Claim 9 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433) in view of Gore (USPN 5257657). Crump teaches the subject matter of Claim 8. See the rejection of Claim 8 under 35 USC 103(a) above. **As to Claims 9 and 10**, Gore teaches that either the layered material or the lower bead can be heated and controlled within well-defined temperature ranges to avoid weak bond formation (5:10-24). Gore additionally teaches that the equilibrium temperature is preferably only slightly below the solidification temperature of the liquid-phase material for objects that are built up rapidly (6:42-45). Because Gore additionally teaches depositing tin (6:65), which melts at approximately 232 degrees C, it would have been obvious to one practicing the combined method that in order to deposit tin, a build chamber temperature greater than 150 degrees C or 200 degrees C would be needed in order to provide an equilibrium temperature only slightly below the solidification temperature in order to maximize the build speed (6:42-45). Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Gore into that of Crump in order to minimize voids and avoid weak joint or bond formation and stress between layers.

9. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433) in view of Reiss (USPN 5581994) and Beeston (USPN 3472452). Crump teaches the subject matter of Claim 8. See the rejection of Claim 8 under 35 USC 103(a). Beeston teaches a chamber heated by convection such that an air flow pattern is created in the chamber (Fig. 1, arrows 72 and 70). Reiss teaches a method for cooling a thermally loaded component by deflecting an air flow pattern towards a thermally loaded component. Crump teaches that control of the temperature around the dispensing head and guide tube is achieved by providing conditioned air to the area by means of a conduit (13:50-54). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Reiss and Beeston into that of Crump in order to a) provide temperature control of the area around the dispensing head by providing a conduit (Crump 13:50-54), b) provide a constant temperature inside an enclosure while the outside temperature varies at random (Beeston 1:26-30), and c) cool the thermally loaded component by deflecting an air flow pattern towards the thermally loaded component (Reiss 1:5-17).

10. **Claim 14, 17, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433). **As to Claim 14**, Crump teaches a method for three-dimensional modeling comprising heating a build chamber to an elevated temperature (15:21-52) dispensing modeling material from an outlet of a dispensing head onto a base provided in a build chamber (Fig. 1) and moving the dispensing head and the base in three-dimensions with respect to one another in synchrony with the dispersing of modeling material so as to build up a three-dimensional object of predetermined shape on the base (16:17-68). Additionally, Crump teaches

the motion of the dispensing head and base being controlled by motion control components which would have obviously been located external and in thermal isolation from the build chamber (Fig. 1, Items 36 and 38). **As to Claim 17**, Crump teaches that moving either of the dispensing head or base in any of the axes is possible (16:17-68). **As to Claim 18**, providing a feedstock material to an inlet external to the build chamber would have been prima facie obvious because Crump teaches a coil (Fig. 5) and the supply rod being inserted into the supply chamber (7:19-25).

11. **Claim 15 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433) in view of Gore (USPN 5257657). Crump teaches the subject matter of Claim 14. See the rejection of Claim 14 under 35 USC 103(a) above. **As to Claims 15 and 16**, Gore teaches that either the layered material or the lower bead can be heated and controlled within well-defined temperature ranges to avoid weak bond formation (5:10-24). Gore additionally teaches that the equilibrium temperature is preferably only slightly below the solidification temperature of the liquid-phase material for objects that are built up rapidly (6:42-45). Because Gore additionally teaches depositing tin (6:65), which melts at approximately 232 degrees C, it would have been obvious to one practicing the combined method that in order to deposit tin, a build chamber temperature greater than 150 degrees C or 200 degrees C would be needed in order to provide an equilibrium temperature only slightly below the solidification temperature in order to maximize the build speed (6:42-45). Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Gore

into that of Crump in order to minimize voids and avoid weak joint or bond formation and stress between layers.

12. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (USPN 5340433).in view of Caugherty (USPN 2117651). Crump teaches the subject matter of Claim 14. See the rejection of Claim 14 above under 35 USC 103(a). **As to Claim 19**, Crump appears to be silent to the claimed limitation. However, it would have been prima facie obvious over Caugherty because Caugherty teaches removing a buildup of material from a cylindrical rod by driving the cylindrical rod against a rotating member of a cleaning assembly (Fig. 2). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Caugherty into that of Crump in order to completely loosen scale on the rod-like extrusion heads of Crump (Fig. 5).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Thursday, 7:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJD 7/9/05

MICHAEL P. COLAIANNI
SUPERVISORY PATENT EXAMINER